



FORMERLY WILLOW RUN LABORATORIES, THE UNIVERSITY OF MICHIGAN

P. O. BOX 618 • ANN ARBOR • MICHIGAN • 48107

PHONE (313) 483-0500

E7.5-10092

CA141156

103300-40-L
18 December 1974

Study of Recreational Land and Open Space
Using SKYLAB Imagery
Monthly Progress Report, November 1974

(E75-10092) STUDY OF RECREATIONAL LAND AND
OPEN SPACE USING SKYLAB IMAGERY Monthly
Progress Report, Nov. 1974 (Environmental
Research Inst. of Michigan) 3 P HC \$3.25

N75-15110

Unclas
CSCL 08B G3/43 00092

EREP Investigation 443
NASA Contract NAS9-13283

"Made available under NASA sponsorship
in the interest of early and wide dis-
semination of Earth Resources Survey
Program information and without liability
for any use made thereof."

Prepared by

Irvin J. Sattinger - Principal Investigator

NASA Technical Monitor

Mr. R. E. Joosten/TF6
National Aeronautics and Space Administration
Johnson Space Center
Principal Investigator Management Office
Houston, Texas 77058

103300-40-L
18 December 1974

Study of Recreational Land and Open Space
Using SKYLAB Imagery
Monthly Progress Report, November 1974

RECREATIONAL LAND ANALYSIS

Current Activities

During the month, S192 data tapes were received for the SL3 Pass, 5 August 1973, over Southeast Michigan, on which major effort is to be placed during the project. These tapes are now being processed to convert them to 7-track data in ERIM format, as a preliminary to further data processing and analysis.

Future Work

As soon as the tape reformatting operations have been completed, sections of the tapes will be printed out in the form of greymaps to conduct an early check of the data and to plan succeeding steps. First attention will be devoted to a 4-township area in Livingston and Washtenaw Counties, because of the favorable atmospheric conditions existing over this area at the time of the pass and because of the availability of extensive ground truth in this area.

SNOW AND ICE HYDROLOGY

Progress

During the month of November, the study of data from SL4 Pass 41, 25 January 1974, was completed to determine the usefulness of the data for monitoring and analyzing snow and ice hydrologic features. The results of the work were submitted to NASA in ERIM Report 103300-38-T, "Skylab Thermal Remote Sensing Imagery and Snow and Ice Monitoring," November 1974. Conclusions reached from the study, as contained in the report, are summarized in the following paragraphs.

Significant Results

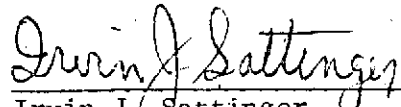
Despite almost uniform surface temperature conditions in the study area, the thermal imagery did illustrate the following possible uses:

1. Surface temperatures relative to 0°C reveal whether the snow and ice cover is wet (i.e., melting) and the melt pattern. This knowledge is useful in hydrologic monitoring of runoff timing and rate, as well as indicating trafficability conditions on the snow.
2. When the surface temperature of snow and ice is below freezing, it may serve as an indicator of spatial variation of air temperatures. This information may be used in calculating the spatial variation of surface radiation budgets, or in observing synoptic weather condition changes or local microclimatic effects.
3. Frozen inland lakes with less than about three or four inches of snow over the ice may be differentiated from surrounding snow covered land areas; this is not always feasible in visible wavelength imagery. The feasibility of this application, of course, decreases as the ice thickness increases.


Thermal data from meteorological satellites have been applied to large area snow cover and sea ice problems, such as energy budgets and navigation problems. Higher resolution thermal imagery would (1) allow extension of these treatments to regional and local scale snow and ice hydrology problems, and (2) aid detailed spatial monitoring of snow and ice accumulation and ablation processes. In particular, the detection of abnormally high temperature substrates such as thermal sources from geothermal activity may be possible (as long as snow temperature remain below the melting point). The increase in knowledge of snowmelt runoff, and the monitoring of snowmelt progression for small to medium sized drainage basins would improve runoff predictions economically, especially when calibrated to limited snow course data.

It must be emphasized that the more intensive the ground truth network for snow and ice measurements is, the more information may be gleaned from the remote sensing data. The spacing of the snow measurement weather stations in this example area inhibits interpretation of snow and ice cover of some areas (especially hilly regions) and greatly increases uncertainty in interpretation.

Submitted:


Irvin J. Sattinger
Principal Investigator

Approved by:


Richard R. Legault
Director
Infrared & Optics Division